

# The importance of fire safety engineering -SFPE from a local and global perspective

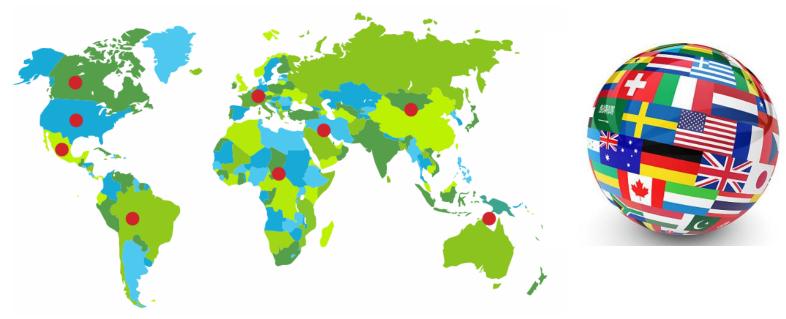
Robert McNamee, Chair SFPE Europe

5500+ 98 26 72
SFPE Members Chapters Student Chapters Countries

### **About SFPE**

**Mission:** To define, develop, and advance the use of engineering best practices; expand the scientific and technical knowledge base; and educate the global fire safety community, to reduce fire risk

# SFPE Chapters are worldwide



- Africa Chapters
- Asian Chapters
- Oceania Chapters
- Canadian Chapters
- Latin American Chapters

- European Chapters
- Middle Eastern Chapters
- US Chapters
- University / Student Chapters
- New chapters added quarterly

# MEMBERSIP FACTS & FIGURES

MEMBERSHIP IS GROWING

SFPE membership has increased 7.8% since March 2023. In providing top-notch, timely and relevant education, seminars and events our members repeatedly find benefit in membership. Targeted campaigns and updated membership benefits also recruit new members to SFPE.

- 2. CHAPTERS ARE BRANCHING OUT
  - With over 122 Chapters and growing, an SFPE Chapter is most likely right around the corner. SFPE Chapters truly carry the mission around the world, bringing local and regional members together. 28 of these chapters are student chapters from institutions across the globe.
- 3. INCREASING EDUCATION

SFPE's sought after education is easier to access than ever. Over 55 webinars, seminars and in-person events were offered over the past year, across the United States and International locations.

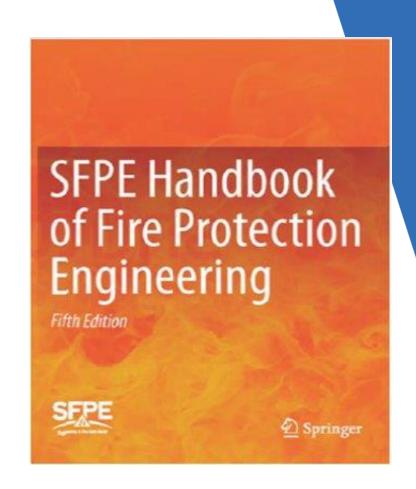
# Strategic Activities – Technical (examples) Complete list at:

https://www.sfpe.org/about-sfpe/governance/strategicplan

- After the 6th edition of SFPE Handbook of Fire Protection Engineering is published, develop plan to maintain Handbook as a living document.
- Start development of new standards or guides on emerging issues in profession.
- Continue to ensure engineering approaches (PBD, Risk, etc.) are incorporated into the global building/fire codes.

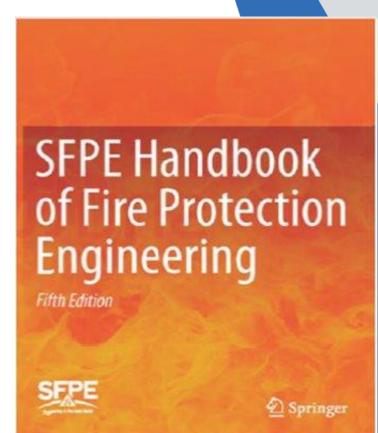
# SFPE Handbook of Fire Protection Engineering

- 6<sup>th</sup> edition to be published in Summer 2024
- Available in hard copy and digitally from Springer
- Topics Include:
  - Fire Protection Engineering Practice
  - Fire Chemistry
  - Heat Transfer
  - Fire Tests
  - Fire Dynamics
  - Fire Protection Systems
  - Structural Fire Protection
  - Human Behavior
  - Industrial Fire Protection
  - Risk & Reliability
  - Wildland Fires (WUI)



# SFPE Handbook of Fire Protection Engineering - New Content

- New Sections on Fire Testing & WUI
- Significant revisions to structural fire section to include performance-based approaches
- New content:
  - Fire investigations
  - Passive fire protection
  - Flame extinction by active systems
  - Building under construction
- New sustainability related content:
  - Li-Ion Batteries & Energy Storage
  - Revised content on mass timber
  - Revised content on building envelop
  - Refrigerants



### SFPE Publications

Five new publications added to SFPE Engineering Series

#### Residential Fire Safety

An Interdisciplinary Approach

Editors: Marcus Runefors, Ragnar Andersson, Mattias Delin & Thomas Gell

Copyright: 2023

Hard cover | Soft cover | eBook



#### SFPE Guide to Fire Risk Assessment

SFPE Task Group on Fire Risk Assessment

Authors: Austin Guerrazzi

Copyright: 2023

Hard cover | Soft cover | eBook



#### Handbook of Fire and the Environment

Impacts and Mitigation

Editors: Brian J. Meacham & Margaret McNamee

Copyright: 2023

Hard cover | Soft cover | eBook



#### Predicting Room of Origin Fire Hazards

Authors: The Society of Fire Protection Engineers

Copyright: 2023

Hard cover Soft cover eBook



#### Testing of Materials for Fire Protection Needs

European Standard Test Methods for the Building

Authors: Linda Makovická Osvaldová & Widya Fatriasari

Copyright: 2023

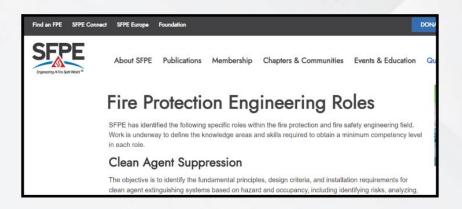
Hard cover eBook

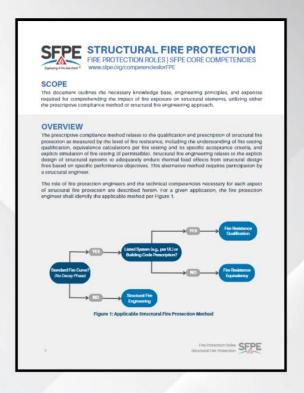


### TIMELINE

# **Core Competencies**







2018

Competency & Credentialing Subcommittee (CPQ C&C) publishes Minimum Technical Core Competencies 2021

CPQ C&C defines the Fire Protection Engineering Roles

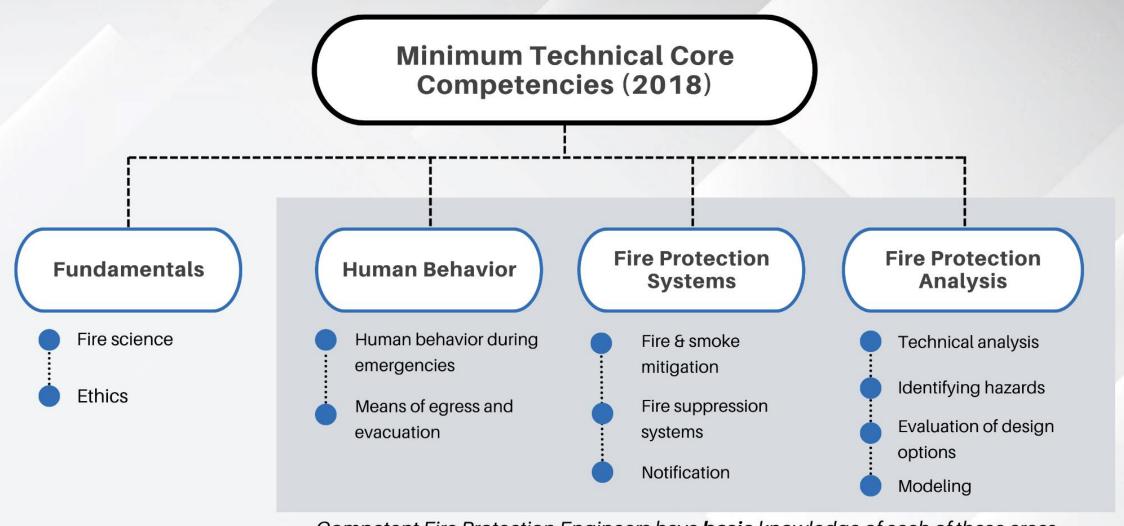
2023

CPQ C&C begins issuing detailed scope documents for each of the Fire Protection Engineering Roles for public comment



Engineering A Fire Safe World

JOIN THE CONVERSATION: #SFPE23 © 2023 SFPE | All rights reserved | sfpe.org



Competent Fire Protection Engineers have **basic** knowledge of each of these areas through education and experience, regardless of their specialty/role.

Available at www.sfpe.org



# SFPE CHAPTERS

Over 120 Chapters worldwide

## Leadership

Chapter Leadership Council: Chapter-to-chapter sharing of exceptional best practices designed to improve chapter performance.

Chapter Leadership Forum: in-person sessions to help with all aspects of leading a chapter.

**Award of Chapter Excellence (ACE):** Gold, Silver, and Bronze levels awarded to exceptionally performing chapters

# SFPE CHAPTERS

# **Partnership**

SFPE Europe, an entity since 2020, has its own BOD, 24 chapters strong, and multiple meetings throughout the year.

SFPE Canada (coming soon), defining mission/vision, seeking closer cooperation through Canadian chapters.

SFPE Asia/Oceania Cooperation Group, virtual networking, and exchange of current projects and events.



# SFPE CHAPTERS

# Engagement

Joint Symposia: Chapters collaborate with SFPE HQ on symposia and help with organizing meetings and events.

Organizing committees: chapter representatives work with SFPE staff on various aspects of organizing conferences, from abstract approval to programming and site visits.

A snapshot of the activities in the Swedish SFPE chapter two years ago

The Swedish context

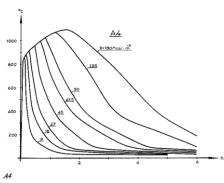
# Fire Safety Engineering in Sweden

Sven

- 1963: Groundbreaking study by Kai Ödeen, "Theoretical Study of Fire Characteristics in Enclosed Spaces"
- 1968, January 1: Swedish regulations changed so alternative fire scenarios was allowed.
- 1970: The Swedish fire curves was "born", Magnusson and Thelandersson, "Temperature—time curves of complete process of fire development. Theoretical study of wood fuel fires in enclosed spaces"
- 1979: Brandforsk, a research sponsor dedicated to the fire area was created
- 1986 The Fire Protection Engineering program on bachelor level was initiated at Lund University Kai Ödeen
- 1996 The Swedish SFPE chapter was born!
- 2006 The Fire Protection Engineering program on bachelor level was initiated at Luleå University









9 members

2 adjunct student members

### The board





Local meeting two times per year

# 5 regional local groups







A group of members doing reviewing

Review of Swedish regulations and handbooks





A conference with focus "brandteknisk ingenjörsvetenskap" (fire engineering science)

Swedish conference every second year



Simo Hostikka, one of the Keynotes 2020



# Prize for notable achievement







- E-mail list
- Homepage including a restricted area only for members
- Linkedin

# How to reach the members



FÖRENINGEN FÖR BRANDTEKNISK INGENJÖRSVETENSKAP

### Sommarhälsing från BIV

Även denna vår och försommar har många av våra medlemmar jobbat hemifrån och de Aven genna var och försomnar har många av vara medlennnar jobbat nenunan och de personliga mötena som får en att vakna till har varit få. Därför år det viktigt att verkligen

Vi har alla olika sätt att ladda batterierna. För er som gillar att slappna av genom att ligga vi nar ana onka san an iauna banenerna. For er som ymar an siappna av genom an ng j hammocken och läsa och titta på brandrelaterade saker rekommenderar vi följande

- BIVs nya tillämpningsstöd "Skillnader mellan SBF 120:8 och SS-EN 12845:2015+A1:2020 och dess påverkan på ett sprinklersystems tillförlitlighet och förmåga". Finns att ladda ned från medlemssidorna på hemsidan. Länk: <u>BIV (sipe</u>
- Brandforsks rapporter och webinarier (Ni vet väl att BIV stödjer Brandforsk!). Drandinisks i apporter our webmaner (m. ver var an bry storger brandinisks).

  Länk: https://www.brandforsk.se/forskningsprojek/. Länk: Seminarier – Brandforsk
- Svar på åhörarnas frågor under vårens digitala lokalgruppsträff kring arbetsplatsens utformning. Länk: BIV (sfpe-biv.se)

Vi kan också berätta att nästa års BIV-dagar kommer att anordnas i slutet av januari i VI KAN OUKSA DELAHE AN NASIA ATS DIV-dagar Kommer an anordnas i suitet av januari i Stockholm, preliminärt 25-26 januari på Norra Latin. Vi kommer att köra samma upplägg som förra gången då vi blandade några utvalda huvudtalare med föredrag från medlemmarna. Mer information kring hur du kan skicka in förslag på föredrag samt upplägg kommer efter sommaren, men börja gärna fundera redan nu på vad just du upplagg kommer ener sommaren, men porja garna undera redan nu pa vaci jusi cu skulle vilja berätta om! Hor också av dig till <u>robert.menamee@ri.se</u> om du skulle vilja var med i organisationskommittén för konferensen, det är kull

#### Glad sommar önskar styrelsen!

Robert Jansson McNamee (Ordförande), Caroline Bernelius Cronsioe (Vice Ordförande), Mattias Delin (Sekreterare), Anders Jönsson (Kassör), Katja Cedergren, Madelene Nordkvist, Ebba Thor, Lotta Vylund och Lina Åteg











#### Glimtar från året som gått, ett lästips och en nyårshälsning från BIV

Nu när vi närmar oss slutet av 2021 så känns det lämplig att göra en kort tillbakablick over året som gått. VI kan börja med att konstatera att även detta år har varit annorfunda

I anslutning till BIVs årsmöte som arrangerades online 16 mars delades BIVs stipendium , ansurung nu nivs aramore som arrangeraces onune 10 mars cleaces blvs supercuum ut. Årets stipendiat är ida Texell, grattis! Stipendiaten exhell 10 000 kr, ett diplom samt ut. Atous supendust ar idat texeut, gratus: oupenkusten ermut 10 000 ar, en unputut seanu into minst åran att vara utvalda av Föreningen för Brandteknisk IngenjörsVetenskapl Här

idas arbete inom kommunal räddningstjänst har utmanat rådande normer och därmed banat icas arbeee mom kommunar raduningspans nar utnaaret radamse normer och usernes och väg för en mer inkluderande räddningsfjänst i Sverige. Ida har genom sitt arbete visat att y ag no en me, manueranne sammingagnini i overige, ma mi genom ani ariver visai ini brandsäkerhet är en del av ett samhälle för alla. Genom sitt mod och sin handlingskraft манизмення аг ен иш av en занивше гог ана. Оепонгзии поо оси sui inspirerar hon andra att vara modiga och våga leda för en bättre värld.

Under mars svarade BIV på två remisser från Brandskyddsföreningen gällande:

SBF 141-5 Regler f\u00f3r utf\u00f6rande av besiktning av brandskyddsanl\u00e4ggning

 opr 1910 negati av attoriance av avandaling sirna brandskyddsanläggning
 SBF 1003-5 Norm Besiktningsfirma brandskyddsanläggning Följande personer ingår i BIVs remissgrupp: Henrik Braatz Maria Broman, Daniel Haarala, rospanse persones anger i nevo remmen upp. remme neuer manin moman, memori. Robert Jonsson, Samuel Larsson, Jesper Lund Ratzer, Mattias Lundqvist och Johan 

- BFS 2021-XX-Föreskrifter om skydd mot buller i byggnader i april (vi swarade på pro svoi -AA-t oresettner om skydu mot buttet i bygyntader i aprit (v. svatsder remissen om buller med anledning av att detta är den första delen av BBR som följer den nya regelstrukturen och därför ansåg styrelsen att denna remiss var nycket viktigt att lämna synpunkter på - vi lämnade alltså inte kommentarer på
- BRAs vägledning avseende AFS 2020:1 i maj

Den 20 maj arrangerade BIV sin andra nationella digitala lokalgruppsträff med över 140 Den av maj arramjerate pry sin amus natuoneus utyrana abzanjenjerata meu over vo deltagare. Amnet var tillgånglighet och frångånglighet utifrån nya APU (Arbetsplatsens

New years letter

Summer greeting 2021

**Publications** 

Best practices on fire safety engineering (Swedish perspective)





CFD-beräkningar vid brandteknisk dimensionering - En Round Robin

Nils Johansson Christian Pelo Johan Anderson Robert Jansson McNamee

Föreningen för brandteknisk ingenjörsvetenskap,

officiell seensk avdelning i Society of Fire Protection Engineers

SFPE European Chapter News

SFPE EUROPEAN CHAPTERS READ MORE

**Publications** 

# Round Robin CFDcalculations



(range of 110 seconds) and available safe escape time (range of 60 seconds), between

the participants. It is important to emphasise that some degree of variation is

unavoidable, as engineers can model things differently without the modelling solution

necessarily being incorrect. Even though it is hard to isolate and specific cause of the

variation, some of the variation seen in this study is related to modelling choices that

are questionable and consequently problematic for the reliability of the fire safety

Fire dynamics, Fire Dynamics Simulator, fire safety engineering, performance-based design,

#### 1 | INTRODUCTION

\*Ramböll AB, Linköping, Sweden

Correspondence Nils Johansson, Division of Fire Safety

There are several different computer models available for different types of analytic fire safety design; the use of such models has increased during the last decades with the increased use of performance-based design. The fluid dynamics model, Fire Dynamics Simulator (FDS)<sup>1</sup> is currently the most used computer model for smoke-MILE (PLU3) IS CENTENTLY THE THOSE USES COMPUTED THE MILE THOSE THE SHOULD TH the model has been shown to predct gas temperatures and the spread of smoke in multi-room geometries<sup>3</sup> very well.

When using complex models, a so-called "Black Box Effect", which implies that the user has a limited understanding of how the model works, can occur. If such circumstances are present, it is difficult for the user to analyse the reliability of the result. When it comes one the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, to snoke filing calculations it is important that the user knows the

phenomenon that is modelled (in this case fire dynamics) and how the model works, in order to specify the appropriate input and interpret the results. One example of this is modelling of fire plumes in FDS where the relationship between the heat release per unit area and the mesh size must be within a certain range otherwise the air entrainment in the plume becomes unnatural. This is something that a user with good knowledge in fire dynamics should be able to detect.

In Sweden, the National Board of Housing, Building and Planning (Boverket) issued general recommendations for analytical design of building fire protection (BBRAD)\* in 2011. The reason behind issuing these recommendations was that differences in analytical designs were large and that decision and assumptions (eg. when a design fire was determined) in designs could be adapted to fit the building design without a sound physical background.5 Nowadays BBRAD can be seen as well established in the country and it is consulted in all types

#### A Round Robin Study on Modelling with FDS

In recent years, different comparisons, so-called round robins, have been conducted to study the variation in results from individual users of complex software. Such comparative studies show that, in many cases, the results are far from equal, even when participants receive identical instructions have been given and use the same software. Based on this, the Swedish Chapter of SFPE (locally called BIV) initiated a new study to investigate how much engineering choices are involved in modelling with the CFD model Fire Dynamics Simulator (FDS). The chapter chose FDS for the study because it is widely used in performance-based fire safety design and has a large number of parameters and inputs that can be adjusted Read more.



#### **Publications**

Summary of our members questions regarding wood in buildings

Questions from active members with the following occupancies:

- Fire consultants
- Insurance companies
- Rescue service
- City planning offices
- Hospital owners
- Universities
- Supplier of fire protection equipment

43 unanswered questions regarding wood and fire!

BIV Rapport 2022:1

Sammanställning av frågeställningar kring trähus och trähusbyggande från föreningen för Brandteknisk IngenjörsVetenskaps medlemmar

Föreningen för brandteknisk ingenjörsvetenskap, officiell svensk avdelning i Society of Fire Protection Engineers



It is important to have fun!



## **SFPE Foundation**

# SFPE Foundation®

#### **About**

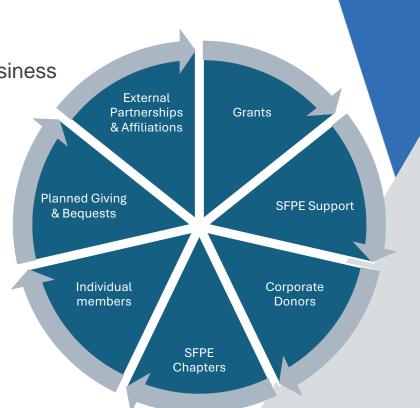
- 501c3 charitable non-profit established in 1979
- *Mission:* To enhance the scientific understanding of fire and its interaction with the social, natural, and built environments.
- Vision: Engineering a resilient, sustainable, fire-safe world for all.

#### Governance

- 17-member Board of Governors
- Staff: Foundation Director, Research Manager, Industry Partnerships & Business Development Manager, Database & Partnership Operations Manager
- Strategic Plan 2022 2025 focuses on four strategic goal areas:
  - Sustainable Resources
  - Diversity, Equity, Inclusion, & Access
  - Innovation for Impact
  - Global Reach

#### **Operations Support**

- In-kind support from SFPE
- External partnerships and grants, e.g., FEMA FP&S grants;
   Grand Challenges Initiative
- Donations from individuals, industry, and SFPE Chapters



# **SFPE Foundation**



#### **Grand Challenges Initiative**

- 34+ GCI Founding Partners; 80+ GCI Working Group members
- Published 4 white papers in GCI topic areas outlining 10-year plan for strategic cooperation in research, education, and outreach
- 3 *Major Research Grants* active in 2024 address GCI priorities:
  - Environmental and Health Impacts of Thermal Runaway Events in Outdoor Lithium-Ion Battery Energy Storage System Installations
  - Fire Testing of Resilient and Sustainable Building Materials
  - Interface Between Digital Buildings and Fire Service Operations

#### Wildland-Urban Interface Initiatives

- FEMA 2020 & 2022 Grants: Creating and expanding the free WUI Virtual Handbook for Fire Service personnel and WUI community members: www.sfpe.org/wuihandbook
- **FEMA 2021 Grant:** Creating 2-day training for US Fire Service personnel on Fire Protection Engineering Basics, Individual Asset Protection, Community Notification & Evacuation, and Community Wildland Fire Protection
- WUI Working Group Initiative: Driving development of WUI expertise across the global fire engineering community













To download, scan the QR code or visit https://bit.ly/SFPEFoundation2023



# **SFPE Foundation**



#### **Student & Award Funding Opportunities**

- Student Research Grants: apps due in March & October annually;
   5k USD per student; about 8 awards per year
- Annual Awards: Student Scholar Award (2 awards, 1k each);
   Mowrer Global Scholar Award (1 award, 1k); Proulx Scholar Award (1 award, 5k total)
- Guise Medal: 1 award annually, 2k USD + keynote presentation
- **Bono Award:** 1 award annually, 2k USD for outstanding research article published in *Fire Technology* journal



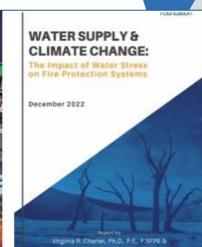
**40 Student Beneficiaries in 15 Countries Since 2021** 

#### Other Activities & Resources

- Open Access Research in Fire Engineering webinar series provides pro dev hours at no cost (membership not required)
- Virtual technical presentations available to SFPE Chapters (contact Dr. Leslie Marshall at foundation@sfpe.org)
- Research reports available for free on our website
- Check out our online **Research Impact Explorer** to see the latest Foundation-funded research projects







**WEBSITE:** https://www.sfpe.org/foundation/home

### **2024 EVENTS**

- Fire Safety Conference on Performance-based Design, Copenhagen, Denmark April 17-19, 2024
- Engineering Symposium: Progress with Li-Ion Battery Fire Safety: Engineering Solutions to Mobility and Storage Hazards, Phoenix, AZ, June 4-6, 2024
- Annual Conference & Expo, Louisville, KY, October 6-8, 2024







Where the world's brightest minds in fire protection and fire safety engineering come together to learn, network, engage, and be inspired

sfpe.org/annual24

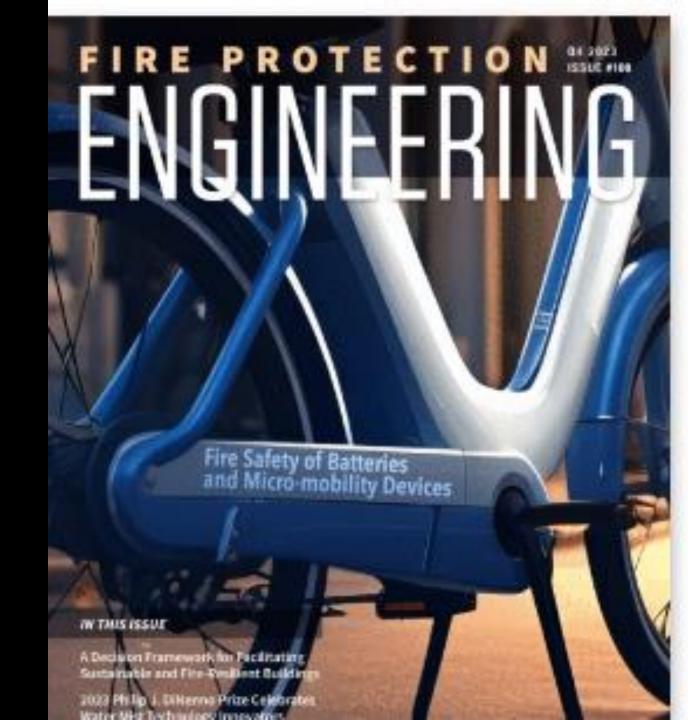
ATTEND | SPEAK | EXHIBIT | SPONSOR



- Day 1 Thermal Runaway and Hazards Fundamentals
   Codes & Standards
- Day 2 & 3 -- Bulk Storage of Battery Products and Hazards of Deployed Products including electric vehicles, micro mobility and energy storage systems. Presentation will cover design considerations as well as mitigation strategies.
- More Information Can be Found at: <a href="https://www.sfpe.org/events-education/liveeducation/in-personeducation/liionsymposium">https://www.sfpe.org/events-education/liveeducation/in-personeducation/liionsymposium</a>

### FPE Magazine

- Quarter 4, 2023 -- Fire Safety of Batteries and Micro-mobility Devices. BY DANIEL MADRZYKOWSKI, PhD, PE, FSFPE, AND CRAIG WEINSCHENK, PhD
- Quarter 2, 2022 -- TOWARD FIRE-SAFE ELECTRIC VEHICLES BY ROELAND BISSCHOP
- Quarter 2, 2022 -- FIRE PROTECTION STRATEGIES FOR ENERGY STORAGE SYSTEMS BY JASON A. SUTULA, PhD, PE
- More info at <u>www.sfpe.org</u>





### Thank you for you attention!

Robert McNamee, Chair SFPE Europe